

IN THE CLAIMS:

1. (currently amended) In a MOSFET transistor with a reactive metal gate electrode, a method for protecting the gate electrode from an underlying gate insulator, the method comprising:

forming a gate insulator overlying a channel region;

forming a first metal barrier overlying the gate insulator,

having a thickness of less than 5 nanometers (nm);

forming a second metal gate electrode overlying the first metal barrier with a work function exclusively responsive to the second metal; and,

wherein the second metal is a material selected from a group including ~~n+ poly, W, Re, RuO₂, Pt, [[Ti,]]~~ Hf, Zr, Cu, V, Ir, Ni, Mn, Co, NbO, Pd, Mo, TaSiN, Al, and Nb.

2. (previously presented) The method of claim 1 wherein forming a second metal gate electrode includes forming a second metal gate electrode having a thickness of greater than about 10 nm.

3. (original) The method of claim 2 wherein forming a first metal barrier includes forming a first metal barrier having a thickness of greater than 1.5 nm, and less than 5 nm.

4. canceled

5. (original) The method of claim 1 wherein forming a gate insulator overlying a channel region includes forming a gate insulator from a material selected from the group including SiO₂, high-k dielectrics

such as HfO₂, ZrO₂, Al₂O₃, La₂O₃, HfAlO_x, and HfAlON, and binary, ternary, and nitrided metal oxides.

6. (original) The method of claim 1 wherein forming a first metal barrier includes forming the first metal barrier from a material selected from the group including binary metals such as TaN, TiN, and WN.

7. (original) The method of claim 6 wherein forming a second metal gate electrode includes forming a second metal gate electrode having a high work function.

8. (currently amended) The method of claim 7 wherein forming a second metal gate electrode with a high work function includes the second metal being selected from the group including Ir, Pt, Cu, Re, Ni, Mn, Co, RuO₂, ~~p+poly~~, Pd, Mo, and TaSiN.

9. (original) The method of claim 6 wherein forming a second metal gate electrode includes forming a second metal gate electrode having a low work function.

10. (currently amended) The method of claim 9 wherein forming a second metal gate electrode with a low work function includes selecting the second metal from the group including Al, Nb, Hf, Zr, V, Ir, ~~n+poly~~, ~~W~~, ~~Ti~~, and NbO.

11. (original) The method of claim 1 wherein establishing a gate work function exclusively responsive to the second metal includes establishing a threshold voltage (V_{th}).

12. (original) The method of claim 1 wherein forming a first barrier metal overlying the gate insulator includes the first metal barrier preventing the migration of oxygen from the gate insulator to the second metal gate electrode.

13-26. canceled

27. (currently amended) In a MOSFET transistor with a reactive metal gate electrode, a method for protecting the gate electrode from an underlying gate insulator, the method comprising:

forming a gate insulator overlying a channel region;

forming a first metal barrier overlying the gate insulator;

forming a second metal gate electrode overlying the first metal barrier having a work function selected from a group consisting of a high work function and a low work function;

wherein the gate electrode has a high work function exclusively responsive to the second metal being selected from a group consisting of Ir, [[Pt,]] Re, Ni, Mn, Co, RuO₂, ~~p+poly~~, Pd, Mo, and TaSiN; and,

wherein the gate electrode has a low work function exclusively responsive to the second metal being selected from the group consisting of Al, Nb, Hf, Zr, V, Ir, ~~n+poly~~, W, Ti, and NbO.

28. canceled

29. (previously presented) In a MOSFET transistor with a reactive metal gate electrode, a method for protecting the gate electrode from an underlying gate insulator, the method comprising:

forming a gate insulator overlying a channel region;

forming a WN metal barrier overlying the gate insulator, having a thickness of less than 5 nanometers (nm); and,

forming a second metal gate electrode overlying the WN metal barrier with a work function exclusively responsive to the second metal.